Science
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	Level 2	Level 3	Level 4
Physical Science			
MS-PS1 Matter and its Interactions	1. Use a model to show that the number of atoms does not change during chemical reactions, that particle motion changes when thermal energy is added to or removed from a system, and to identify reactants and products in a chemical reaction.	Develop and use models to show that mass is conserved during chemical reactions and to predict changes in particle motion when thermal energy is added to or removed. Analyze and interpret patterns in data to determine if a chemical reaction has occurred by means of comparing products and reactants.	Evaluate and revise a model that describes how mass is conserved during chemical reactions and to explain predicted changes in particle motion when thermal energy is added to or removed. Analyze and interpret patterns in data in order to predict the outcomes (products) of a chemical reaction
MS-PS2 Forces and Motion	Describe how data from an investigation could be used as evidence to support the claim that change in an object's motion depends on its mass and the forces with which it interacts.	Conduct an investigation and use data to construct an argument that change in an object's motion depends on its mass and the forces with which it interacts.	Plan and conduct an investigation to produce data to use as evidence to construct an argument that change in an object's motion depends on its mass and the forces with which it interacts.
MS-PS3 Energy	3. Use graphical displays of data to describe the relationships of an object's speed and kinetic energy to the object's mass and support an argument that when an object's kinetic energy changes, energy is transferred to or from the object.	Construct graphical displays of data that can describe the relationships of an object's speed and kinetic energy to the object's mass and construct an argument that when an object's kinetic energy changes, energy is transferred to or from the object.	no change
MS-PS4 Waves and their Applications in Technologies for Information Transfer	Use a graphic mathematical model to describe the relationship between wave characteristics and wave energy and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	Use mathematical represenation or formula to describe the relationship between wave characteristics and wave energy and develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	Use mathematical represenation or formula to support the claim that there is a relationship between wave characteristics and wave energy and evaluate and revise a model to describe that waves are reflected, absorbed, or transmitted through various materials.
Life Science			
MS-LS1 From Molecules to Organisms: Structures and Processes	5. Use data from an investigation and a model to support the arguments that: all living things are made up of cells; all living things may form sub-systems which are part of larger systems ; characteristic animal behaviors and specialized plant structures affect the probability of reproduction.	Use data from investigations to develop a model to support the arguments that: all living things are made up of cells; all living things may form sub-systems which are part of larger systems; characteristic animal behaviors and specialized plant structures affect the probability of reproduction.	Revise and evaluate a model using multiple sets of data to construct arguments that; all living things are made up of cells; all living things may form sub-systems which are part of larger systems; characteristic animal behaviors and specialized plant structures affect the probability of reproduction.
MS-LS2 Ecosystems: Interactions, Energy, and Dynamics	6. Use a model to identify the dynamic relationships between the diverse types of living and nonliving parts of an ecosystem, which includes the flow of energy and the cycling of matter; use data to describe how those relationships can affect human access to natural resources.	Develop and use a model to describe the dynamic relationships between the diverse types of living and nonliving parts of an ecosystem, which includes the flow of energy and the cycling of matter; analyze data and interpret data to determine those relationships can affect human access to natural resources.	Evaluate strengths and limitations of a model to analyze the dynamic relationships between the diverse types of living and nonliving parts of an ecosystem which includes the flow of energy and the cycling of matter; analyze and interpret data to explain how those relationships could affect human access to natural resources in the future.

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MS-LS3 Heredity: Inheritance and Variation of Traits	7. Use a model to describe why sexual or asexual reproduction have different results in genetic variation of offspring and why structural changes to genes (mutations) affect the structure and function of an organism.	Develop and use a model to describe why sexual or asexual reproduction have different results in genetic variation of offspring and why structural changes to genes (mutations) affect the structure and function of an organism.	Compare multiple models which describe how both sexual and asexual reproduction have different results in genetic variation and why structural changes to genes (mutations) affect the structure and function of an organism
MS-LS4 Biological Evolution: Unity and Diversity	8. Describe patterns in the fossil record data to use as evidence for changes in populations over time, and use the data to support an explanation that some organisms survive better than other organisms because of differences in traits.	Analyze data for patterns in the fossil record data to use as evidence for changes in populations over time, and use the data to construct an explanation that some organisms survive better than other organisms because of similarities and differences in traits. .	Analyze and interpret multiple data sets for patterns in the fossil record data to use as evidence for changes in populations over time, and use the data to evaluate and revise an explanation that some organisms survive better than other organisms because of similarities and differences in traits.
Earth and Space Science			
MS-ESS1 Earth's Place in the Universe	9. Use a model to describe patterns of motions of the sun, Earth, and moon system and the role of gravity in the motions of objects within the galaxy. Use data to determine scale properties of objects in the solar system and to identify data that provides evidence how the geologic time scale is used to organize Earth's history.	Develop and use a model to describe patterns of motions of the sun, Earth, and moon system and the role of gravity in the motions of objects within galaxies and the solar system. Analyze and interpret data to determine scale properties of objects in the solar system and to determine how the geologic time scale is used to organize Earth's history.	Evaluate and revise a model to describe patterns of motions of the sun, Earth, and moon system and the role of gravity in the motions of objects within galaxies and the solar system. Analyze, interpret, and compare multiple data sets to determine scale properties of objects in the solar system and to determine how the geologic time scale is used to organize Earth's history.
MS-ESS2 Earth's Systems	10. Use a model to describe the flow of energy driving the cycling of water and Earth's materials within and among Earth's systems. Identify data that can support an explanation for how geologic and atmospheric processes have changed Earth's surfaces at varying time and spatial scales.	Develop and use a model to describe the flow of energy driving the cycling of water and Earth's materials within and among Earth's systems. Analyze and interpret data that can support an explanation for how geologic and atmospheric processes have changed Earth's surfaces at varying time and spatial scales.	Evaluate and revise a provided model to describe the flow of energy driving the cycling of water and Earth's materials within and among Earth's systems. Use scientific reasoning to analyze and interpret data to construct an explanation for how geologic and atmospheric processes have changes Earth's surfaces at varying time and spatial scales.
MS-ESS3 Earth and Human Activity	11. Identfiy among competing options, an explanation based on evidence that the uneven distribution of Earth's resources results from geoscience processes. Apply scientific principles to select among competing solutions those which best minimize human impact on the environment. Analyze and interpret data about natural hazards to forecast and mitigate their effects.	Construct an explanation based on collected or selected evidence that the uneven distribution of Earth's resources results from geoscience processes. Apply scientific principles to design solutions that minimize human impact on the environment. Analyze and interpret data about natural hazards to forecast their effects and determine strategies for mitigating those effects.	Evaluate and revise explanations based on evidence that the uneven distribution of Earth's resources results from geoscience processes. Apply scientific principles to evaluate and revise solutions that minimize human impact on the environment. Analyze, interpret, and communicate data from multiple sources about natural hazards to forecast and mitigate their effects.
Engineering and Design			
MS-ETS1 Engineering Design	12. Given criteria and constraints, develop a successful solution to a problem that takes into account potential impacts on people and the environment that may limit possible solutions and use competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	Define the criteria and constraints to develop a successful solution to a problem that takes into account potential impacts on people and the environment that may limit possible solutions and evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	Define and use the criteria and constraints to develop a successful solution to a problem that takes into account potential impacts on people and the environment that may limit possible solutions and evaluate and revise competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.